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HUMAN EFFECTS ON MOUNTAIN GOATS IN THE SAWTOOTH NATIONAL FOREST

Human Effects on Mountain Goats in the Sawtooth National Forest

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INTRODUCTION

Mountain goats are native to the northern Rocky Mountains and northern Cascade Mountains of the contiguous United States and many of the mountain ranges of western Canada and Alaska. In this century, many population segments have experienced declines due to hunting (legal and illegal) and disturbances associated with energy exploration, mining, logging, and increased road access into goat habitat (Joslin 1986 and Chadwick 1983). Concern about the effects of consumptive and non-consumptive human activities on the population status of mountain goats has increased in recent years.

During the winter of 1995-6 we conducted a study of mountain goats in selected areas of the Sawtooth National Forest, which is the southern extent of the native range of the species. In this forest the mountain goat is a management indicator species for which specific management guidelines are written to ensure a healthy and viable population. The study involved research of existing literature on the ecology and management of mountain goats and field observations of goats from October 1995 - March 1996. The study identified critical mountain goat winter range, assessed potential conflicts caused by human recreational use in these areas, and determined that snowmobiles, helicopters, low-flying planes, and back-country skiers/hikers all present potential disturbances to wintering goats. This report reviews aspects of mountain goat ecology relevant to the study, evaluates disturbances to mountain goats, and contains management recommendations for mountain goat critical winter range in the Sawtooth National Forest.

STUDY AREA

General Description

We conducted the study in portions of the Sawtooth National Recreation Area (SNRA) and the Ketchum Ranger District (KRD) of the Sawtooth National Forest. Based on mountain goat distribution and physiography, we divided the study area into two main segments: the Smoky Mountains (Smokies) and the Boulder Mountains (Boulders). The Smokies segment covers approximately 49 square miles, mostly in the SNRA, and consists of the Smoky Mountains drained by Titus Creek, Coyote Creek, Owl Creek, Prairie Creek, Newman Creek, and Norton Creek; the latter two drainages located in the Ketchum Ranger District. The second segment, the Boulders, covers approximately 20 square miles in the SNRA and consists of the Boulder mountains, referred to as the Boulder Front, extending from north of Easley Peak south to Boulder Peak.

Elevation

Both segments of the study area contain peaks and ridgelines over 10,000 ft in elevation. The Smokies contain 14 peaks over 10,000 ft, the highest being 10,441 ft. The Big Wood River drainage marks the lowest elevation point at around 6700 ft and acts as the boundary between the Smokies and the Boulders. The Boulders contain 3 peaks over 11,000 ft and much of the area used by goats in winter is higher in elevation than that used in the Smokies.

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Precipitation

Measurements on March 4, 1996 from two high elevation (8780' and 8960') weather stations in the upper Big Wood River watershed for both snow water equivalents and precipitation were higher than the thirty (30) year average, reflecting a greater snow depth throughout the study area. For example, at Galena Summit (8780') the average precipitation from October - March 4th reads 18.3" whereas this winter 20.4" (111% of average) accumulated.

Vegetation and Topography

The majority of the study area comprises a coniferous forest interspersed with small stands of Aspen, subalpine sage, and riparian meadows. Dominant conifer species include lodgepole pine (Pinus contorta) at lower elevations, Douglas Fir (Pseudotsuga mensiezii), Subalpine Fir (Abies lasiocarpa), and Engelmann Spruce (Picea engelmannii) at mid- to upper-elevations, and Whitebark Pine (Pinus albicaulis) at higher elevations. Exposed ridges and peaks, steeply sloped cliffs, and cirque basins are present at or above treeline. Mountain goats generally inhabit the alpine and subalpine zones of the study area that are characterized by sparse and stunted vegetation.

METHODS

From October 1995 through March 1996, we performed field observations, participated in Forest Service meetings, obtained information from knowledgeable locals and the Idaho Department of Fish & Game's aerial surveys, and carried out a literature review on mountain goats. Field work involved locating goats on the winter range and observing these areas for potential disturbances. We used a 15-60x zoom spotting scope and 8x40 and 10x42 binoculars. We took field notes and transferred them to a "mountain goat monitoring form," an example of which is included in Appendix B. A summary of our days in the field are provided in Appendix C.

REVIEW OF MOUNTAIN GOAT ECOLOGY

Mountain goats have come to inhabit an alpine environment of steep rocky cliffs, sharp pinnacles, narrow ledges, and high talus slopes for approximately the last 100,000 years. Key adaptations aid mountain goats' survival in their treacherous terrain. These adaptations include an eight-inch thick fur coat grown for the winter and shed in late spring, hooves that are soft on the underside and hard on the edges to grip rocks and ice, and an extremely strong musculature that enables travel through their often steep home ranges.

The mountain goat diet consists of forbs, grasses, shrubs, and trees. Forbs and grasses make up the bulk of the diet when they are most available during late spring, summer, and early fall (Chadwick 1983). During this time, goats build up fat reserves to help them through the long winters when forage is limited. In winter, the goats will dig through snow and ice to reach dried ground vegetation but rely increasingly more on conifer branches, exposed shrubs, and their fat reserves.

In general, native mountain goats live and travel in small groups. In Montana, Chadwick (1983) most often observed bands of two to four goats and also regularly saw solitary individuals. Larger groups of goats gather during the rutting season in November and early December when adult breeding takes place. Generally native mountain goats first breed in the fall of their third year. Following the rut, the goats frequently split up again and remain in small groups or solitary throughout the winter. The tendency to spread out minimizes the potential threat of avalanches or other accidents that could eliminate a large group of goats at once. Goats typically reduce movements considerably in winter as an

adaptation to limit energy expenditures when many of the usual travel routes are covered by deep snow. Many researchers have found that mountain goats are very methodical in their use of range (including winter range) and thus the most suitable habitat is utilized by goats year after year (Chadwick 1983, Joslin 1980). Because of this behavior, goats are slow to colonize (or recolonize) unused areas. Female mountain goats possess home range knowledge that they pass on to their offspring. The adult female, responsible for carrying a fetus and/or protecting her young kid, winters in the best home range that offers the most abundant forage and the most effective escape terrain. Once gestation is complete in late May or early June the adult nanny often separates from her yearling so she can give birth to her young in solitude.

The population dynamics of mountain goats differ from that of other big game such as deer and elk whose populations often remain within the carrying capacity due to predation and human hunting. Although many predators, including golden eagles, mountain lions, and bears, prey opportunistically on goats, the mountain goat is not a significant prey species for any predator. Rather, the primary factors limiting goat populations (avalanches, rock slides, climbing accidents, and starvation in winter) are caused by the terrain and climate of their mountain homes and are forms of density-independent mortality. Prime limiting factors also include low natality rates and low survival rates to reproductive age. Chadwick (1983) found that, on average, only fifty percent (50%) of capable females gave birth in any given year. Females most commonly give birth to a single kid; twins are quite rare. Mortality due to predation or starvation most often falls on the smaller sized kids, yearlings, and subadults who tend to be more vulnerable to predators and less able to paw through deep snow for food.

RESULTS & DISCUSSION

Population Status

Since the winter of 1967, Idaho Department of Fish & Game biologists have conducted aerial population surveys for mountain goats every five years (on average). Idaho Department of Fish & Game identifies our study area encompassing the upper Big Wood River watershed drained by the Smokies and Boulders as Hunting Unit 48. Survey routes have not been uniform in all years, therefore survey results from 1990 and 1994, which both covered Unit 48, will be cited (B. Palmer, pers. com.). The February 1990 survey located fifty-nine (59) goats, of which sixteen (16) were kids. The February 1994 survey numbered sixty-five (65) goats in the same area and counted thirteen (13) kids. During this study in the same area, we found a minimum of fifty-three (53) goats (24 with 5 kids in Boulders and 29 with 2 kids in Smokies) including seven (7) kids. Therefore our total numbers reflect those of past surveys, although the current number of kids is significantly lower.

Habitat Description and Correlations With Behavior

The Smokies comprise mountain peaks connecting multiple ridgelines that fall between drainages and descend in elevation east toward the Big Wood Basin. For winter range, mountain goats use pockets of steep or wind-blown terrain separated by forested areas and other zones covered in deep snow. We observed mountain goats using the ridgelines as travel corridors to move to their prospective winter range before deep snow impeded movement. Some goats moved down in elevation to rocky outcrops while others remained in suitable patches of high elevation terrain. One example involved a nanny and kid observed through mid-November and early December on rutting grounds with several other goats on the west slope of Titus Peak. In December the nanny and kid traveled east and down in elevation for about two miles along the Owl Creek/Coyote Creek ridgeline to winter range consisting of bare cliffs broken up by snowfields and forested areas. The

nanny and kid were observed on these cliffs about a mile up the Owl Creek drainage throughout the winter.

The Boulders, or Boulder Front, consists of peaks connected by a continuous ridgeline. This high elevation ridge system is exposed to extreme winds throughout the winter. The south and west facing slopes remain essentially snow-free with minimal or non-existent avalanche danger throughout much of the suitable goat terrain. This feature allows a freedom of movement not available to most goats in the Smokies and thus goats observed in the Boulders throughout the winter were much more mobile and unpredictable. While small bands and individuals were spotted, a large group of up to twelve (12) goats was observed on several occasions throughout the winter, presumably because they could afford to travel in numbers without the risk of avalanche. Interestingly, on several occasions, we observed numerous goats on one day and none or very few the following day. For example, on February 29th we saw fourteen (14) goats in the Boulders and on March 1st saw zero (0) from the same viewing area. This shows that goats on the Boulders are quite mobile in winter.

Rutting Areas

During November and early December we observed several distinct rutting grounds in the Smokies and Boulders. We saw goats assembled in three separate areas in the Smokies during the rut period. One group consisted of seven (7) goats originally gathered on the west slope of Titus Peak in mid-November. This group moved down the ridgeline between Owl and Coyote Creeks about two miles to a talus slope where the goats remained throughout early December. Another concentration of at least fifteen (15) goats occurred in the Norton Creek drainage on the slope and ridge north of the creek. On December 3rd two (2) goats were sighted on top of the ridge system between Prairie Creek and West Fork Prairie Creek. During our observations, both were gazing down onto the SW facing slope (out of our view), possibly at other goats. Six (6) goats were seen in the same location on January 31st, suggesting the possibility that a large group had gathered there in the fall for the rut.

In general, rutting groups were more mobile in the Boulders. However, at least twenty-four (24) goats were observed during the rut. On November 20th a group of fourteen (14) goats was observed on the ridge east of Silver Peak and two groups of five (5) were seen on the ridge east of Easley Peak.

Winter Range

During this study, we observed goats inhabiting much of the study area. In the Boulders, we saw goats utilizing the entire Boulder Front which extends from one mile north of Easley Peak to about one mile southeast of Boulder Peak. In the Smokies, we observed goats occupying cliffs and ridges in several drainages including Owl, Prairie, West Fork Prairie, Newman, and Norton Creeks (see maps). In some areas winter range is distinct from rutting grounds; in other areas the rutting grounds also serve as winter range.

In winter, when most areas are covered by deep snow, goats rely on snow-shedding cliffs and wind-blown slopes to provide adequate forage to last them through the winter. The availability of suitable winter range is a limiting factor for goat populations. Winter is the most tenuous time for goats with the highest rates of natural mortality (Chadwick 1983). Therefore management guidelines must ensure that all suitable areas remain available to wintering goats.

Factors Affecting Mountain Goats

Whereas many ungulate prey species rely on speed and/or safety in numbers as means of escaping predators, mountain goats have long depended on cliffs and other steep terrain in their home range for predator avoidance (Chadwick 1983). In most cases, safety

is only a few steps away. However, the goats' affinity for exposed cliffs and heavy reliance on specific areas throughout different times of the year combine to make the goats especially vulnerable to human activities.

In a study designed to determine mountain goats' reactions to potential disturbances in Alberta, Canada, Penner (1988) found that goats, excluding nannies and kids, can become habituated to predictable auditory stimuli. However, new and sudden noises or approaches by humans disrupted the goats, evidenced by goats stopping normal behavior to investigate and by flight behavior (Penner 1988). Goats' reactions to disturbances tend to be unpredictable and a poor indicator of stress response. Threatened behavior may vary from remaining stationary on an exposed cliff face, to crouching under an overhang, to running toward cover. If continuous disturbances cause abandonment of an area over several generations, successive generations of offspring will lose the home range knowledge essential for the continued use of that area.

Disturbance to goats in winter induces stress which increases the goats' metabolic rate which in turn burns important fat reserves (Chadwick 1983, Joslin 1980). Joslin (1980) also states that the effects of increased, human-caused stress may lead to a rise in mortality in the short term and reduced productivity of a herd over the long run. Kids, yearlings, and adult females carrying an unborn fetus are likely to be most susceptible to stress-related mortality (Chadwick 1983).

Hunting - Due to their habit of utilizing exposed terrain, individual goats are often easy to locate and kill. Human-caused mortality is often additive and thus destructive to mountain goat populations (Kuck 1977, 1986). Hunting and poaching have been a primary factor in the reduction and elimination of many native goat herds (Kuck 1986).

From 1983 to 1990, four (4) permits per year were issued for what is now Unit 48. Since 1991, the Idaho Dept. of Fish and Game has permitted two (2) goats to be harvested each year in Unit 48. We recommend that hunting of mountain goats be closed in Unit 48. (See Appendix C for hunting results from 1986-1995).

Livestock - The Forest Service allots permits for domestic sheep grazing in portions of the study area. Sheep potentially utilize important seasonal range of mountain goats, resulting in competition for forage during the summer and fall. Mountain goats depend on abundant forage during this time in building up adequate fat reserves. Competition from livestock could decrease the fitness of wintering goats, thus domestic sheep should be restricted from mountain goat habitat.

Roads - Networks of roads, originally built for logging and mining purposes, leading into mountain goat range threaten the health of mountain goats herds and have been referred to as the single biggest threat to the survival of mountain goat herds throughout North America (Phelps et al. 1975, Jamieson 1978, Joslin 1980). Roads allow for easier access which contributes to a greater flux of humans entering mountain goat terrain. Increased disturbances may displace goats out of home range which diminishes the productivity of the herd over time. Hunter access may become concentrated and jeopardize the survival of a particular herd. In addition to the threat of easier access, roads also carry the unpredictable noise of passing vehicles to which goats fail to become habituated (Penner 1988). Chadwick (1983) found that some roads and their associated disturbances caused the reduction and elimination of goats in many drainages in the Swan Mountains of Montana. Road closures have been initiated in Washington by the game department and US Forest Service to "retain quality of hunt and protect goats from poachers and harassment" (Johnson 1983).

Logging/ Mining/ Seismic Exploration - Human resource extraction may result in road building, helicopters, the presence of more people, and the disruption of the terrain (removal of trees, erosion, loss of vegetation, etc.), all of which disturb mountain goats.

As a result of continued disturbance, mountain goats may become temporarily or permanently displaced from sites most capable of supporting goats and relocate into sites already supporting resident goats or into inferior sites with minimal forage opportunities and minimal escape terrain (Chadwick 1983, Klimstra et al. 1979). Joslin (1986) reported that while goats did not permanently abandon home ranges due to seismic exploration in Montana, she suggested stress was cumulative over several years, resulting in reduced herd productivity.

Recreation - The consequences of recreational disturbances on goats and other big game are difficult to measure but can be inferred from observations, research (see Knight and Cole 1991, Bleich et. al. 1990, and Penner 1988), and the known effects of stress (Joslin 1980). Hikers, skiers, snowmobiles, helicopters, and low-flying airplanes can all potentially disturb goats, increasing their metabolism and causing a high degree of stress. Repeated disturbances can cause temporary displacement or abandonment of an area.

During this study, two instances of flight in response to human disturbances were observed. On November 2nd as we climbed the ridge north of Norton Creek, we startled five (5) goats, including a nanny and kid, who all fled between one and two hundred yards across a scree slope. Four moved out of sight and one watched our descent from a high vantage point for over an hour. On January 11th, S. Hamilton observed a nanny and kid in Owl Creek ascend over one hundred yards in several minutes in response to the yelling back and forth of two skiers in the drainage below. The nanny remained attentive, looked downslope, and did not resume feeding for at least twenty-five minutes after the skiers had left. Numerous other potential disturbances were observed in or near known goat range when the authors were not in position to view the reactions of goats. Snowmobile tracks reached 10,700 feet in the Boulder Mountains within one-half mile of known goats; military airplanes flew low over Owl Creek forcing us to cover our ears; helicopters flew south on the Owl Creek side of the highway 75 corridor.

Penner (1988) found that, "...the sound of a helicopter frequently elicited concerned or alarm responses..." in goats in his Alberta, Canada study area. Joslin (1980) stated that, "Helicopters cause very strong goat flight and hiding responses and even if the goat remains motionless in a secure spot its anxiety level is likely to be raised." She also related an experience of watching a young goat fall ten feet onto its back while trying to flee from a helicopter (Joslin 1980). Idaho Department of Fish and Game biologist Bruce Palmer recalled that during helicopter surveys some goats took flight before actually seeing the helicopter, indicating a strong auditory response (B. Palmer, pers. com.). Palmer suspects that these goats may be older and have had previous experience with helicopters.

Snowmobiling in mountain goat winter range and kidding areas also present a considerable threat to goats, especially in late winter and early spring when goats are left in a weakened state (Joslin 1980). Hikers and skiers that approach goats too closely can cause implications during this time as well. Hikers on trails bisecting mountain goat range can cause disturbances any time of year. Repeated disturbances may alter seasonal use patterns in goats and could keep the goats from the most productive feeding areas.

Existing arguments evaluate what form of recreation causes more of an impact on wildlife. Some people contend that a snowmobile which travels in and out of an area more quickly causes less disturbance than a skier who approaches and leaves an area over a longer period. Others argue that snowmobile noise carries farther and that snowmobiles can cover more ground, causing more disturbances in a day. However, the important point is that each of these activities can disrupt the goats in their own way.

All these factors indicate human recreation on mountain goat winter range and kidding areas may be detrimental to the fitness and long-term persistence of mountain goat herds on the Sawtooth National Forest.

CURRENT MANAGEMENT SITUATION

Presently, access for backcountry skiers/snowshoers in goat range is unlimited. Snowmobile access in these areas is limited only where conflicts with groomed cross-country skiing trails exist. Many areas of goat range are closed to use by the commercial helicopter skiing operation whereas other zones, known as "areas of concern," require a flyover search before operating in the area. If goats are seen, the area is then considered closed for the day.

Obviously this management scheme is not uniform in its limitations and may not be entirely effective in protecting the goats from disturbances. For example, some areas are closed to helicopter use but allow skiers and snowmobilers to encroach upon critical mountain goat range. Thus there is an apparent need for consistency in regulations affecting mountain goat winter range and awareness among recreationists regarding the life history and ecology of mountain goats.

RECOMMENDATIONS

Mountain goats are a management indicator species. Specific management goals addressed in guidelines of the Sawtooth National Forest Land and Resource Management Plan (1987) call for protection of goats on their winter range. Because human use of these areas in all seasons is quickly growing, we recommend that a comprehensive mountain goat strategy, involving designations of open, closed, and limited access areas, be developed to minimize future conflicts and to ensure the protection of mountain goats. In this section we discuss proposals for management of recreational activities in mountain goat winter range.

Because humans on skis/snowshoes, snowmobiles, and helicopters can all potentially startle goats, we base our recommendations on the assumption that these activities have similar disturbance potentials. However, because the motorized sound of helicopters and snowmobiles carries farther than the sound of humans on foot, the following recommendations take into account the greater distance from which helicopters and snowmobiles may potentially disturb goats.

Snowmobiles

Close all areas of confirmed mountain goat winter range to snowmobile access. This should include areas, such as Owl Creek, that presently receive no snowmobile use but may become a desirable area in the future as the technology of oversnow vehicles continues to expand. Closed areas should contain a three-quarters (3/4) of a mile buffer zone to avoid auditory disturbances.

Helicopters and Other Aircraft

Close all areas of confirmed mountain goat winter range to helicopter/ low-flying plane access and overflight. This should include all present "areas of concern". Closed areas should contain a three-quarters (3/4) of a mile buffer zone to avoid auditory disturbances.

Backcountry Skiers, Hikers, and Snowshoers

Close known goat terrain (ridgelines, cliffs, etc.) in confirmed winter range to backcountry travel in winter in order to avoid startling disturbances. Post signs in valleys draining goat terrain in order to: alert travelers that goats may be present on cliffs and ridges above them, warn that noise levels should be minimized to avoid auditory disturbances, and state that goats should not be approached for any reason.

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APPENDIX A : Mountain Goat Hunt Results for IF&G Unit 48 from 1986-1995

1986 : (2 goats) Location - Prairie Cr., Ridge between Big Lost Lake and Norton Lakes

1987 : (3) Location - Owl Cr., E. Fork of N. Fork Big Wood R., Big Lost Lake

1988 : (4) Location - Owl Cr., Cherry Cr., ridge west of upper Newman Cr., 1 unknown

1989 : (3) Location - Prairie Lake, head of Newman Cr., ridge south of Ryan Peak

1990 : (4) Location - Prairie Lake, Miner Lake, Galena Peak, Galena Peak/Cherry Cr.

1991 : (1) Location - Silver Cr.

1992 : (1) Location - Prairie Cr.

1993 : (2) Location - unknown

1994 : (2) Location - Silver Cr., W. Fork Big Wood R.

1995 : (2) Location - Silver Cr., Owl Cr.

APPENDIX B

MOUNTAIN GOAT MONITORING FORM

Sawtooth National Forest

Location: _____

Date:_____

Observer(s):_____

Weather:_____ Temperature_____

Goats Observed #: _____ Female: ____ Male:_____

Adults:____Subadults: _____ Yearlings:_____ Kids:____ Unknown:_____

Time Vehicle Left:_____

Time of First Sighting/Sign:_____

Time at Observation Point(s):_____to_____

Goat Behavioral Observations (Include time and location):

Potential Disturbances (livestock, recreational use, aircraft, observers, etc.; include time and location):

Other Wildlife Sightings/Sign:

Appendix C

SUMMARY OF MOUNTAIN GOAT MONITORING

Sawtooth National Forest---The Boulders

October 22 1995 thru March 14 1996

DATE	OBSERVATION POINT(S)	LOCATION OF GOAT(S) *SCAT / TRACKS*	# OF GOATS	AGE & SEX
11-20-95	South West Bowl of Silver Peak	South Ridge of Silver Peak	**14**	6F, 3M; 9 adults, 2 subadults, **3 kids**
	Prairie Creek Campground	South East Ridge of Easley Peak	**10**	2F, 3M; 5 adults, 2 subadults, **2 kids**
1-12-96	Prairie Creek Trailhead	Peak South of Easley Peak	**3**	2 adults, 1 sub-adult, 1 yearling
1-22-96	HWY 75	*Tracks on Easley & Boulder Peaks*, Boulder Peak	**1**	unknown
1-23-96	Owl Creek	Easley Peak	**12**	2F; 8 adults, 2 subadults, **2 kids**
1-30-96	Prairie Creek T.H.	Easley Peak	**8**	5 adults
1-31-96	Prairie Creek T.H.	Easley Peak	**10**	5 adults, **2 kids**
2-1-96	HWY 75	Boulder Peak West Slope of Silver Creek	— **1**	unknown unknown
2-4-96	HWY 75	Boulder Front	—	unknown
2-9-96	HWY 75	Boulder Front	—	unknown
2-12-96	HWY 75	Boulder Front	—	unknown
2-29-96	South East Knob of Boulder Peak	Crown Point (Boulder Peak) East Peak of Boulder Peak Easley Peak	**2** **1** **11**	2 M; 2 adults 1 M; 1 adult 1 F, 1M; 2 adults, **1 kid**
2-29-96 cont.	HWY 75	South East of Easley Peak South Ridge of Silver Peak	**1** **2**	1 adult 1F; 1 adult, **1 kid**
3-1-96	HWY 75	Boulder Front	—	—
3-6-96	HWY 75	South Ridge of Silver Peak	**1**	unknown
3-8-96	HWY 75	Crown Point (Boulder Peak) South Ridge of Boulder Peak Ridgeline North of Easley Peak	**1** **1** **8**	1M; 1adult unknown unknown
3-13-95	HWY 75	East Peak of Boulder Peak	**1**	1M; 1 adult

Appendix C

SUMMARY OF MOUNTAIN GOAT MONITORING

Sawtooth National Forest---The Smokies

October 22 1995 thru March 14 1996

DATE	OBSERVATION POINT(S)	LOCATION OF GOAT(S) *SCAT / TRACKS*	# OF GOATS	AGE & SEX
10-22-95	Antenna Peak	*Scat on South Slope of Titus*	—	—
10-25-95	Owl Creek	*Tracks and Scat on Ridgeline Southeast of Bromaghin*	—	—
10-29-95	Antenna Peak	*Tracks Traversing Bromaghin*	—	—
10-30-95	Newman	South Face & East Face of Newman Bowl	**3**	1 F, 1 M; 2 adults
11-2-95	South East Ridge of Norton Peak	South East Ridge of Norton Peak	**11**	1F, 1M; 3 adults **1kid**
11-3-95	South East Ridge of Norton Peak	South East Ridge of Norton Peak & East Face of Newman Bowl	**10**	1F, 2M; 3 adults, **1 kid**
-9-95	Antenna Peak	—	—	—
11-9-95	Owl Creek	—	—	—
11-13-95	Prairie Lakes Trail	—	—	—
11-14-95	Norton Creek Trail	South East Ridge of Norton Peak	**12**	3 F, 5M; 8 adults, 4 sub-adults
11-16-95	Antenna Peak	North West slope of Titus Peak	**7**	3F, 3M; 5 adults, 1 subadult, **1 kid**
11-17-95	Norton Creek Trail	South East Ridge of Norton Peak	**7**	3F, 4M; 6 adults, 1 subadult
11-23-95	Antenna Peak	North West Ridge of Titus Peak	**6**	1F, 2M; 2 adults, 1 subadult, **1 kid**
11-24-95	Norton Creek Trail	South East Ridge of Norton Peak	**15**	2F, 6M; 8 adults, 6 subadults
11-29-95	Antenna Peak	North Ridge of Owl Creek	**5**	**1 kid**
12-2-95	Ridge between Owl Creek & West Fork of Prairie Creek	North Ridge of Owl Creek	**5**	1F, 1M; 2 adults, 1 subadult, **1 kid**
12-3-95	North Ridge of Norton Peak	North Ridge of Owl Creek North West Peak of Prairie Creek	**5** **2**	1F, 1M; 2 adults, 1 subadults, **1 kid** 1F, 1M; 2 adults

12-6-95	Antenna Peak	North Ridge of Owl Creek	**5**	1F, 1M; 2 adults, 1 subadult, **1 kid**
1-4-96	Antenna Peak	*Tracks on North Ridge of Owl Creek*	—	—
1-5-96	Owl Creek	North Ridge of Owl Creek	**3**	1F, 1M; 2 adults, **1 kid**
1-9-96	Owl Creek	*Tracks on North Ridge of Owl Creek*	—	—
1-11-96	Owl Creek	North Ridge of Owl Creek	**2**	1F; 1 adult, **1 kid**
1-14-96	Owl Creek	North Ridge of Owl Creek	**2**	1F; 1 adult **1 kid**
1-22-96	HWY 75	*Tracks on North Ridge of Owl Creek*		
1-23-96	Owl Creek	North Ridge of Owl Creek	**2**	1F; 1 adult, **1 kid**
1-30-96	Owl Creek	North Ridge of Owl Creek	**1**	1 F; 1 adult
1-31-96	Prairie Creek	Ridge between Prairie & W. Fork of Prairie Creeks	**6**	unknown
2-1-96	Prairie Creek T.H.	Ridge Between Prairie & W. Fork of Prairie Creeks	**2**	1 adult
2-11-96	Owl Creek	North Ridge of Owl Creek	**2**	1 F; 1 adult, **1 kid**
2-16-96	Antenna Peak	North Ridge of West Fork of Prairie	**2**	1 adult
2-17-96	Owl Creek	*Tracks on North Ridge of Owl Creek*	—	—
2-25-96	Owl Creek	North Ridge of Owl Creek	**2**	1 F; 1 adult, **1 kid**
3-6-96	Norton Creek Trail	South East Ridge of Norton Peak	**5**	4F; 4 adults, **1 kid**
3-8-96	HWY 75 Owl Creek	Headwaters of Newman Creek North Ridge of Owl Creek	**1** **2**	unknown 1F; 1 adult, **1 kid**
3-9-96	Goshawk Peak (North of Antenna Peak)	North Ridge of Norton Peak	**2**	unknown
3-14-96	Owl Creek	North Ridge of Owl Creek	**2**	1F; 1 adult, **1kid**